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10/790,434

02/27/2004

Xiang Liu

LIU-27-5-18

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10/09/2008

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EXAMINER

TRAN, DZUNG D

ART UNIT

PAPER NUMBER

2613

MAIL DATE

DELIVERY MODE

10/09/2008

PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

| | | | |
|------------------------------|--------------------------------------|-----------------------------------|--|
| Office Action Summary | Application No. 10/790,434 | Applicant(s) LIU ET AL. | |
| | Examiner Dzung D. Tran | Art Unit 2613 | |

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 30 January 2008.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-20 is/are pending in the application.
- 4a) Of the above claim(s) 16 and 18 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-15, 17, 19-20 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Specification

Claim Rejections - 35 USC § 101

1. 35 U.S.C. 101 reads as follows:

Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.

The claimed invention is directed to non-statutory subject matter.

Claim 1 claimed: generating a phase shift keyed optical signal and propagating the optical signal through a semiconductor optical amplifier which is not produce a useful, concrete, and tangible result.

Claim 10 claimed: propagating a phase shift keyed optical signal through a semiconductor optical amplifier which is not produce a useful, concrete, and tangible result.

Claim Rejections - 35 USC § 112

2. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

3. Claims 1, 2 recite the limitation “the optical signal” in line 3 of claim 1 and “the amplified optical power” in line 4 of claim 1 and line 1 of claim 2. There is insufficient antecedent basis for this limitation in the claim.

Claim 3 recites the limitation “the gain recovery time” in line 1 of claim 3. There is insufficient antecedent basis for this limitation in the claim.

Claim 11 recites the limitation “the gain recovery time” in line 1 of claim 11. There is insufficient antecedent basis for this limitation in the claim.

Claim Rejections - 35 USC § 102

4. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(a) the invention was known or used by others in this country, or patented or described in a printed publication in this or a foreign country, before the invention thereof by the applicant for a patent.

5. Claims 1-5, 9-12, 17 and 20 are rejected under 35 U.S.C. 102(a) as being anticipated by Leuthold et al. IEEE Photonics Technology Letters , Vol. 16, No.6, June 2004, Manuscript received December 24, 2003, revised February 9, 2004.

Regarding claims 1 and 20, as far as Examiner understood, Leuthold discloses in Figure 1, a method/apparatus comprising:

a laser and pulse generator for generating a phase-shift keyed optical signal;
and

propagating the optical signal through a semiconductor optical amplifier SOA in deep saturation to regulate the amplified optical power (page 1582).

Regarding claim 2, , as far as Examiner understood, Leuthold discloses wherein the amplified optical power is regulated to about the saturation output power of the SOA (page 1583, left column).

Regarding claim 3, , as far as Examiner understood, Leuthold discloses wherein the gain recovery time of the optical amplifier is larger than the bit period of the optical signal (page 1583, right column).

Regarding claim 4, Leuthold discloses wherein the optical signal has a data-independent intensity profile (page 1582).

Regarding claim 5, Leuthold discloses wherein the optical signal is an RZ-DPSK signal (page 1582).

Regarding claim 9, Leuthold discloses wherein $\Delta P_{out} \text{ (dB)}/\Delta P_{in} \text{ (dB)}$ of the optical amplifier is less than about 0.25, wherein P_{out} is the power of the optical signal output from the amplifier and P_{in} is the power of the optical signal input into the amplifier (see Figure 2 and page 1583).

Regarding claim 10, , as far as Examiner understood, Leuthold discloses a method for optical limiting amplification comprising:

propagating a phase-shift keyed optical signal having a data independent intensity profile through a semiconductor optical amplifier such that $\Delta P_{out} \text{ (dB)}/\Delta P_{in} \text{ (dB)}$ is less than about 0.25, to regulate the amplified optical power, where P_{out} is the power of the optical signal output from the amplifier and P_{in} is the power of the optical signal input into the amplifier (see Figures 1 and 2; pages 1582-1583).

Regarding claim 11, Leuthold discloses wherein the gain recovery time of the optical amplifier is larger than the bit period of the optical signal (page 1583, right column).

Regarding claim 12, Leuthold discloses wherein the optical signal is an RZ-DPSK signal (page 1582).

Regarding claim 17, Leuthold discloses an optical signal processor apparatus comprising:

a semiconductor optical amplifier device adapted to operate in deep saturation and to receive an RZ-DPSK optical signal having an amplitude-shift keyed optical label portion, such that the optical label portion of the signal is removed upon propagation through the semiconductor optical amplifier device (page 1582).

Claim Rejections - 35 USC § 103

6. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

7. Claims 6-8, 13-15 and 19 are rejected under 35 U.S.C. 103(a) as being unpatentable over Leuthold et al. IEEE Photonics Technology Letters , Vol. 16, No.6, June 2004, Manuscript received December 24, 2003, revised February 9, 2004

Regarding claim 19, Leuthold discloses an optical signal processor apparatus comprising:

a semiconductor optical amplifier device adapted to operate in deep saturation and to receive an RZ-DPSK optical signal having an amplitude-shift keyed optical label portion, such that the optical label portion of the signal is removed upon propagation through the semiconductor optical amplifier device (page 1582).

Leuthold differs from claim 19 of the present invention in that he does not specifically disclose a plurality of semiconductor optical amplifiers. However, whether the apparatus comprises one SOA for equalizing one channel or a plurality SOAs for equalizing a plurality channels is merely an engineering design choices.

Regarding claims 6-8 and 13-15, Leuthold discloses wherein the optical signal is a DPSK signal (page 1582). Therefore, whether the DPSK signal is a $\pi/2$ -DPSK signal or constant-intensity DPSK signal or RZ-DQPSK signal is merely an engineering design choices.

Conclusion

8. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Dzung D Tran whose telephone number is (571) 272-3025. The examiner can normally be reached on 9:00 AM - 7:00 PM.

Art Unit: 2613

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jason Chan, can be reached on (571) 272-3022. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Dzung Tran
09/30/2008

/Dzung D Tran/
Primary Examiner, Art Unit 2613